

## FT 1900. CONTINUOUS MONITORING WITH MULTI-PARAMETER METERS

Use in conjunction with:

- FT 1000 General Field Testing and Measurement
- FQ 1000 Field Quality Control Requirements
- FS 1000 General Sampling Procedures
- FD 1000 Documentation Procedures

1. INTRODUCTION: Many facilities rely on in-line continuous measurement devices to monitor parameters such as dissolved oxygen, conductivity, pH, temperature, residual chlorine and turbidity. In order to ensure the stability and reliability of such measurements, the calibration of these instruments must be checked regularly. In cases where it is impractical to take these instruments off-line on a daily basis, use the calibration procedures described below.

### 2. CALIBRATION AND USE

2.1. Calibrate the instrument **before installation** using the prescribed procedures for initial calibration described in the parameter-specific SOPs (e.g., FT 1100, FT 1200, FT 1400, FT 1500 and FT 2000). For Turbidity, perform the calibration of the sensor (in the multi-probe instrument) according to the manufacturer instructions.

2.2. **On a daily basis** measure a grab sample taken at the same location as the in-line monitor. The test measurements must be taken with an instrument that has been properly calibrated per the FDEP SOPs (i.e., checked or calibrated daily).

2.3. Compare the results of the daily check with the continuous monitor reading taken at the same time as the sample was collected. The multi-parameter or continuous meter calibration is acceptable if the results meet the following criteria:

2.3.1. Dissolved Oxygen: no greater than 0.2 mg/L difference (or historically established criteria not to exceed 0.5 mg/L difference);

2.3.2. Specific Conductance: no greater than 10% of the calibrated instrument reading;

2.3.3. pH: no greater than 0.2 pH units difference (or historically established criteria not to exceed 0.5 pH units difference);

2.3.4. Temperature: no greater than 0.5°C difference;

2.3.5. Residual Chlorine: no greater than 20% of the calibrated instrument reading; and

2.3.6. Turbidity: no greater than 20% of the calibrated instrument reading.

Higher acceptance ranges may be considered by FDEP on a case-by-base basis. The FDEP Environmental Assessment Section will help in preparing a suitable study design.

2.4. Perform the initial calibration (per section 2.1 above) each time the instrument is taken off-line, after every preventative maintenance activity, and **immediately** after determining that any of the criteria checks in 2.3.1 through 2.3.6 above are not met.

3. See FT 1000, section 2.2 for specific quality control measures that must be observed.

4. If historically generated data demonstrate that a specific instrument remains stable for longer periods of time, the time interval between initial calibration and calibration checks may be increased.

4.1. All acceptable field data must be bracketed by acceptable checks (see section 2.3 above). Qualify data that are not bracketed by acceptable checks (see FT 1000, section 2.2.6).

4.2. The maximum time interval is one month or at the conclusion of a sampling event, whichever is less.

4.3. Base the selected time interval on the shortest interval that the instrument maintains stability.

4.4. If an extended time interval is used, and the instrument consistently fails to meet the final calibration check:

4.4.1. The instrument may need maintenance to correct the problem; or

4.4.2. The time period is too long and must be decreased.

4.5. Retain all data associated with studies that support a decreased frequency of calibration checks for at least five years after the procedure was last used.

5. PREVENTIVE MAINTENANCE: Refer to FT 1000, section 3.

6. RECORDS

6.1. Record all information specified in the individual SOPs.

6.2. Document the daily checks by recording:

- Date
- Time
- Location
- Reading from the continuous monitor
- Reading from the second instrument
- The name of the person conducting the check

6.3. Where applicable, calculate and record the percent difference of the results being compared. Indicate the acceptability of the check per criteria in section 2.3